

WHAT IS CLAIMED IS:

1 1. A game machine, comprising:
2 a traveling field, on which platen dots are provided; and
3 a plurality of self-propelled members, which are provided on the
4 traveling field, each including:
5 a first yoke, which constitutes a first linear motor together
6 with the platen dots for propelling the self-propelled member in a first direction
7 on the traveling field;
8 a second yoke, which constitutes a second linear motor
9 together with the platen dots for propelling the self-propelled member in a
10 second direction which is perpendicular to the first direction;
11 a motor;
12 a miniature member, which is coupled with the motor so as
13 to be rotatably supported on the self-propelled member; and
14 a controller, which controls the motor such that a rotated
15 angle of the miniature member is determined in accordance with a propelling
16 direction of the self-propelled member.

1 2. The game machine as set forth in claim 1, wherein ball bearings are
2 provided on a bottom face of the self-propelled member to assist the propelling
3 on the traveling field.

1 3. The game machine as set forth in claim 1, wherein each of the first
2 yoke and the second yoke is formed with three legs provided with coils, to

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1 10. The game machine as set forth in claim 1, wherein the self-propelled
2 member includes a compressor for blowing compressed air toward the
3 traveling field through nozzles formed on a bottom face thereof, to form an air
4 bearing layer between the bottom face and the traveling field to support the
5 self-propelled member thereon.

1 11. A self-propelled member which propels on a traveling field provided
2 with platen dots thereon, comprising:

3 a first yoke, which constitutes a first linear motor together with the
4 platen dots for propelling the self-propelled member in a first direction on the
5 traveling field;

6 a second yoke, which constitutes a second linear motor together with
7 the platen dots for propelling the self-propelled member in a second direction
8 which is perpendicular to the first direction;

9 a motor;

10 a miniature member, which is coupled with the motor so as to be
11 rotatably supported on the self-propelled member; and

12 a controller, which controls the motor such that a rotated angle of the
13 miniature member is determined in accordance with a propelling direction of
14 the self-propelled member.

1 12. The self-propelled member as set forth in claim 11, wherein ball
2 bearings are provided on a bottom face of the self-propelled member to assist
3 the propelling on the traveling field.

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1 13. The self-propelled member as set forth in claim 11, wherein each of
2 the first yoke and the second yoke is formed with three legs provided with coils,
3 to constitute three-phase linear motor.

1 14. The self-propelled member as set forth in claim 13, wherein a lower
2 end portion of each leg is split into plural projections each having an identical
3 width with a width of each platen dot.

1 15. The self-propelled member as set forth in claim 12, wherein the ball
2 bearings are composed of at least three independent ball bearings.

1 16. The self-propelled member as set forth in claim 12, wherein the ball
2 bearings are supported within an annular retainer formed on the bottom face of
3 the self-propelled member to constitute a thrust bearing.

1 17. The self-propelled member as set forth in claim 11, wherein the motor
2 is a pulse motor.

1 18. The self-propelled member as set forth in claim 11, wherein a skirt
2 member is formed on a peripheral portion of a bottom face of the self-propelled
3 member.

1 19. The self-propelled member as set forth in claim 11, wherein the
2 self-propelled member includes a compressor for blowing compressed air
3 toward the traveling field through nozzles formed on a bottom face thereof, to

form an air bearing layer between the bottom face and the traveling field to support the self-propelled member thereon.

20. A racing game machine, comprising:

a racing track;

a traveling field extending below the racing track, on which platen dots are provided;

a plurality of miniature members, which are provided on the racing track to be raced with each other, each miniature member provided with a magnetic substance; and

a plurality of self-propelled members, which are provided on the traveling field while being associated with the respective miniature members, each self-propelled member including:

a first yoke, which constitutes a first linear motor together with the platen dots for propelling the self-propelled member in a first direction on the traveling field;

a second yoke, which constitutes a second linear motor together with the platen dots for propelling the self-propelled member in a second direction which is perpendicular to the first direction;

a guide magnet, which constitutes a torque transmission coupling with the magnetic substance of the associated miniature member;

a motor, which rotates the guide magnet so as to turn a posture of the associated miniature member via a magnetic force; and

a controller, which controls the motor such that a rotated angle of the guide magnet is determined in accordance with a propelling

23 direction of the self-propelled member.

1 21. The game machine as set forth in claim 20, wherein ball bearings are
2 provided on a bottom face of the self-propelled member to assist the propelling
3 on the traveling field.

1 22. The game machine as set forth in claim 20, wherein each of the first
2 yoke and the second yoke is formed with three legs provided with coils, to
3 constitute three-phase linear motors.

1 23. The game machine as set forth in claim 22, wherein a lower end
2 portion of each leg is split into plural projections each having an identical width
3 with a width of each platen dot.

1 24. The game machine as set forth in claim 21, wherein the ball bearings
2 are composed of at least three independent ball bearings.

1 25. The game machine as set forth in claim 21, wherein the ball bearings
2 are supported within an annular retainer formed on the bottom face of the
3 self-propelled member to constitute a thrust bearing.

1 26. The game machine as set forth in claim 20, wherein each of the guide
2 magnet of the self-propelled member and the magnetic substance of the
3 miniature member is composed of arcuate N-pole magnets and arcuate S-pole
4 magnets which are arranged alternately and annularly.

4 electric power to the linear motors of the self-propelled member via the ball
5 bearings.

1 33. A self-propelled member which propels on a traveling field provided
2 with platen dots thereon, comprising:

3 a miniature member, which is provided with a magnetic substance;

4 a first yoke, which constitutes a first linear motor together with the
5 platen dots for propelling the self-propelled member in a first direction on the
6 traveling field;

7 a second yoke, which constitutes a second linear motor together with
8 the platen dots for propelling the self-propelled member in a second direction
9 which is perpendicular to the first direction;

10 a guide magnet, which constitutes a torque transmission coupling with
11 the magnetic substance of the miniature member;

12 a motor, which rotates the guide magnet so as to turn a posture of the
13 miniature member via a magnetic force; and

14 a controller, which controls the motor such that a rotated angle of the
15 guide magnet is determined in accordance with a propelling direction of the
16 self-propelled member.

1 34. The self-propelled member as set forth in claim 33, wherein ball
2 bearings are provided on a bottom face of the self-propelled member to assist
3 the propelling on the traveling field.

1 35. The self-propelled member as set forth in claim 33, wherein each of
2 the first yoke and the second yoke is formed with three legs provided with coils,
3 to constitute three-phase linear motors.

1 36. The self-propelled member as set forth in claim 35, wherein a lower
2 end portion of each leg is split into plural projections each having an identical
3 width with a width of each platen dot.

1 37. The self-propelled member as set forth in claim 34, wherein the ball
2 bearings are composed of at least three independent ball bearings.

1 38. The self-propelled member as set forth in claim 34, wherein the ball
2 bearings are supported within an annular retainer formed on the bottom face of
3 the self-propelled member to constitute a thrust bearing.

1 39. The self-propelled member as set forth in claim 33, wherein each of
2 the guide magnet of the self-propelled member and the magnetic substance of
3 the miniature member is composed of arcuate N-pole magnets and arcuate
4 S-pole magnets which are arranged alternately and annularly.

1 40. The self-propelled member as set forth in claim 33, wherein the motor
2 is a pulse motor.

1 41. The self-propelled member as set forth in claim 33, wherein a skirt
2 member is formed on a peripheral portion of a bottom face of the self-propelled

3 member.

1 42. The self-propelled member as set forth in claim 33, wherein the
2 self-propelled member includes a compressor for blowing compressed air
3 toward the traveling field through nozzles formed on a bottom face thereof, to
4 form an air bearing layer between the bottom face and the traveling field to
5 support the self-propelled member thereon.

1 43. The game machine as set forth in claim 33, wherein the magnetic
2 substance of the miniature member is divided magnetic poles forming an
3 induced magnet.

1 44. The game machine as set forth in claim 34, wherein the ball bearings
2 are made of metal, through which electric power is supplied to the linear
3 motors.